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The President's Message

With this issue of the JOURNAL, a new Editor and Editorial Board make their bow to the Society. A letter from Walter McBride, received April 28, stated, "As chairman of the Editorial Board of the Journal of Dentistry for Children, I am tendering you, herewith the resignations of the board and editor. You may accept this collective resignation or accept the individual resignations coming from each member. This action was taken at a recent board meeting in which we were discussing plans for an improved Journal. Finally the opinion grew that perhaps we might do it better justice if we all resigned and turned it over to a complete new group of men with new ideas and new spirit. A new board with an old editor, or a new editor with an old board would not do, we think, what a complete change in personnel might. We trust the Executive Council will honor these resignations."

The Council accepted the resignations and then approved the appointment of Alfred E. Seyler, Detroit, Michigan, as Editor, and Stanley Brown, Ithaca, Michigan; James Gasaway, Detroit, Michigan, and C. Ray Taylor, Lansing, Michigan, as members of the Editorial Board.

The name of Sam Harris has been associated with the JOURNAL since its inception. He has seen the JOURNAL develop from a mimeographed sheet to a 32 page quarterly. Walter McBride, Kenneth Easlick and Kenneth Gibson were the original members of the Editorial Board which was created in 1937. These men have always been faithful in performing their duties and have continually endeavored to improve the JOURNAL. Needless to say we appreciate their years of service.

The new editor and board members are familiar to those in the field of pedodontics. We know they will "carry on" and that the future of the JOURNAL is in good hands.

* * * * *

The Council recently authorized the expenditure of some of the Society's funds for the purchase of War Bonds. Accordingly, ten $100 Series E War Bonds were purchased during the Fifth War Loan drive.

RALPH L. IRELAND

The Technics That May Be Utilized in Operative Procedures to Secure Better Behavior in Young Patients

J. R. THOMPSON, D.D.S.
Dallas, Texas

In recent years the dental profession has become increasingly cognizant of the importance of dental care for the child patient as a preventive of dental disease later in life.

The dental survey—conducted by the American Dental Association, in cooperation with the United States Public Health Service, in 1933-1934 in which approximately 1,600,000 grade school children were examined, in 26 states showed that 90% of them were in need of dental treatment with only a small percentage receiving adequate dental care.

Education of lay groups, especially of parents and children, as to the importance of early and regular dental care for children as it is developing in many states will rapidly improve existing conditions if accompanied by the ability of the dental profession to understand child management, to eliminate pain to the minimum consistent with good dentistry and to render adequate service to the child patient.

Many articles appear in dental magazines of today regarding the psychology of child management in the dental office that should awaken the interest of every dentist whose practice includes children and should prove of untold value to him in his work. But this knowledge must be accompanied by such skill in operating technic that pain is eliminated or reduced to the minimum that is consistent with good service, if these children are to continue as regular patients under his care.

This paper is a discussion of technics that may be used in operative dentistry alone to secure better behavior in young patients and, since the reduction of pain is the most important factor in securing better behavior, I will discuss it from the standpoint of its elimination through operative procedures.

The first visit of a child to a dental office should entail only painless operations, such as an examination of the teeth with a mouth mirror and explorer, full mouth x-rays and a prophylaxis. If the lips show any evidence of a chapped condition or any irritation, they should be greased with a little vaseline or cold cream before the child is asked to open its mouth.

Many patients complain of the discomfort and sometimes of pain accompanying the use of x-ray films due to careless manipulation of the films. This can be entirely avoided by turning the edges and corners of the film packet where it comes in contact with mouth tissues.

A prophylactic treatment will be more pleasant to the child patient if a flavored paste is used and irritation to the gum tissue is avoided by the intelligent use of a *small* rubber cup.

In this first visit which has taken not more than thirty minutes of the operator's time, much has been accomplished. In addition to the actual work done, the most important result of the visit is that the child leaves the office with the impression that "going to the dentist" is not the dreaded experience he had heard it would be, but rather that it is only another new and untried experience and not at all unpleasant.

When he returns to the office for the more extensive operations that are necessary, requiring cavity preparations, pulpotomies, extractions and whatever may be done to restore the mouth to a normal, healthy condition and to re-establish the normal functions of his teeth, attention must be paid to procedures that will minimize and many time eliminate the unpleasant sensations due to operative technic.

Many simple operations can be performed without the use of a local anaesthetic and without pain by the recognition and avoid-

ance of factors that cause it and by the proper manipulation of instruments. If this can be done it will work to the mutual advantage of both patient and dentist.

We need to recognize and consider carefully the sensitive areas in a tooth before we begin the preparation of a cavity. Dr. L. W. Thom[2] states that according to Charles F. Bodecker[3] the most sensitive areas of a tooth are (1) the pulp, (2) the dentino-enamel junction, (3) the granular layer of Tomes and (4) the interglobular spaces in the dentin. In operative procedure, where the pulp is vital and not involved, we are most interested in the dentino-enamel junction. Dr. Bodecker's theory is that the dentinal tubules are channels in the dentin conveying the protoplasm fibrils of the odontoblasts to the pulp. Just before they reach the dentino-enamel junction, these fibrils split into many branches, saturating this area with peripheral sense organs.

To be able to prove this theory or not, is of no particular consequence so long as we recognize that the area is sensitive and that we operate with this fact always in mind. Dr. Bodecker further recommends that the dentin below the dentino-enamel junction be undermined to the desired extent with an inverted cone bur, and thus the lines of communication be cut off so that the isolated area is not sensitive.

Thermal changes cause a great deal of pain. Sudden, extreme, or prolonged changes in temperature in the dentin can be controlled to a large extent and the extent to which they are controlled determines the degree of pain that is caused. According to Dr. Paul H. Jeserich[4], a great variance of temperature was found to take place within the pulp chamber dependent on many factors in operative procedures. Cavities could be prepared with as little as one degree increase in temperature or with as high as twenty-five degrees increase in temperature.

Dr. Jeserich states also, that in operating on a given tooth, thermal changes were found to depend on the following definite factors: (1) size, sharpness and speed of rotation of the revolving instruments used; (2) pressure exerted; (3) direction of pressure and whether the pressure is exerted in one or more directions at the same time; (4) whether the pressure exerted is a sustained pressure or an intermittent one; (5) whether the operation is performed in a dry, wet or moist field.

It was found that the smaller instruments produced the least increase in temperature if all other factors were equal. Larger fissure burs and stones caused the greatest amount of thermal change. In the smaller sized round burs and inverted cones, the possibility of thermal change was small even with considerable abuse of the other factors governing the production of thermal change. In the use of stones, all other factors being the same, the amount of thermal change was directly proportional to the size of the stones used.

In Dr. Jeserich's research it was found that the most favorable speed of rotation was found to be second speed on most foot controls or about two thousand revolutions per minute. This would vary greatly if other factors were changed, such as amount of pressure exerted, whether pressure is sustained or intermittent, and with the direction or directions of pressure. Pressure is therefore important in three different ways. Tests of the hand pressure of many dentists while using the contra-angle handpiece and operating on a tooth showed a variance of from one or two pounds to twenty and twenty-five pounds. It was determined that three or four pounds should be the maximum in all cases and that thermal change is almost directly proportional to pressure, all other factors being equal.

Direction of pressure was found to play an important role in operating, particularly with fissure burs and cylindrical stones. In making an occlusal cut, if downward pressure was exerted in an attempt to gain depth simultaneously with lateral pressure, in an attempt to gain lateral extension, the amount of thermal change was very high. Downward pressure in any case, with fissure burs or cylindrical stones on the pulpal floor of a cavity, was found to be conducive to thermal change and should therefore be avoided. The most efficient and least abusive method seems to be to gain depth with a small stone or round bur and then to work laterally and with an occlusalward pull when using the larger fissure burs and stones. Intermittent pressure with a three to four second contact in contrast to more sustained contact is conducive to the least thermal change. Also, it is best to make each intermittent contact at a slightly

different point, that is, the operator should move his bur or stone at least the diameter of the instrument in making each successive contact.

The dry field was found to be more conducive to increased temperature change than either the moistened or wet field. However, in general, a steel bur operating in a dry field causes less increase in temperature than a stone operating in a dry field. And a stone operating in a wet field proved less productive of thermal change than a bur in a wet field. A great check on thermal changes was noted when a steel bur was operating in a moistened surface.

Because of these findings, Dr. Jeserich suggests technic to insure minimum thermal changes in enamel, dentin and pulp as follows:

1. Use burs and stones as small and as sharp as possible.
2. Use an unglazed surface on stones.
3. Use second speed on foot control or about fifteen hundred to two thousand revolutions per minute.
4. Use a hand pressure of from one-half pound to four pounds maximum and avoid exerting pressure in more than one direction at the same time. Particularly avoid gaining depth on the pulpal floor of a cavity by exerting pressure toward the pulp. Use intermittent pressure of from one to four pounds in contrast to sustained pressure and apply pressure at different areas at each time of contact.
5. It is possible to operate in a dry field with steel burs with slight thermal increase if all the above precautions are exercised.
6. Use a moist or wet field for stones in all cases.
7. It is safer to operate in a wet field in all cases where either fissure burs or stones are used if there is a question as to the amount of pressure, length of contact time and size of the instrument.

There are other factors which should be taken into consideration in preparation of cavities when burs and stones are used. Worn handpieces and contra-angles that permit burs and stones to vibrate, produce an unpleasant sensation and add materially to thermal changes and should be avoided. Dr. Thom[2] quotes Bissel B. Palmer[5] as follows:

> Another factor that sharpens fear is that the roots of a tooth are imbedded in bone-bone of a jaw. Consequently, each manual disturbance or vibration of the teeth is transmitted to these bones and, by conduction, directly to the skull surrounding the brain. Moreover, sounds emanating from dental procedures, become amplified, owing to the proximity of the organs of hearing, and increase fear of patients, even when no pain is involved. This mental condition indicates the important role of imagination and anticipated anguish in the production of dental fear.

Dr. Thom continues his discussion by saying that a dentist who uses equipment which vibrates cannot prepare cavities in teeth with precision, nor can he avoid abusing his patient.

The engine belt should be kept in good repair as a worn area or a rough spot in the belt produces a vibration which is noted at the end of a bur or stone and is thus transmitted to the tooth. Proper tension of the engine belt is necessary to eliminate vibration.

In the course of cavity preparation, care should be used in the temperature of the solution used to wash it out, whether an antiseptic solution or water be used. The liquid should be body temperature or slightly above as a colder solution applied to an open cavity may cause pain and should be avoided.

In the removal of carious and disintegrated dentin sharp excavators are the choice of many careful operators, thus avoiding the chance of thermal change and the danger of going through thin, sound dentin into the pulp.

In cases where a rubber dam is to be used and a clamp is necessary, care in the selection of the clamp and its placing is an important factor. Sometimes it may be well to use a little topical anaestheic, carefully applied to the tissue surrounding the neck of the tooth to relieve the discomfort and perhaps pain of placing the clamp. Often the use of ligatures can be avoided by the proper manipulation of the dam at the gingiva. The occasional use of varnish or liquid rubber will complete the seal.

Phenol, applied to the dentin and allowed to dry in the cavity lessens sensitivity in some cases. Silver nitrate and eugenol can be used in deciduous molars but cannot be used in permanent teeth because of its tendency to discolor the tooth.

Improperly mixed cement often heats after being placed in the cavity, causing pain. Care should be taken not to mix it too hurriedly and to follow the proper technic for mixing to avoid pain as it sets.

The matrix should be carefully adjusted and trimmed to fit the shape of the gum surrounding the tooth, to prevent it going into the gum tissue. Only an extra moment of time is required to fit it properly.

The small jaws of the young patient need additional support when amalgam is to be placed in lower teeth. If an amalgam is to be properly placed it requires from six to eight pounds pressure on the plugger, so by placing the palm of the hand under the jaw and exerting pressure upward, corresponding to the downward pressure of the plugger any feeling of discomfort will be removed.

Conductive anaesthesia is used today more often than any other type of anaesthetic in dental operations. Many find it as satisfactory for operative work on small children as for adults. I will not discuss the technic of making an injection for anaesthesia but only wish to emphasize the importance of using a sharp needle, of not more than twenty-five gauge, to insure the minimum of discomfort. In my practice, I like to apply a topical anaesthetic for a few seconds before inserting the needle. A sterilized, cotton roll can be placed over the needle until it is close to the mouth of the child patient and then removed so the needle is not to be seen by the child, and the fear of its use is thus avoided.

"We have at our command numerous therapeutic agents," says Dr. Chas Sweet[6], "which will be of value to us in the relief of mental and physical pain. They should be administered without hesitation. The nervous or highly excitable child very frequently should have prescribed for him some sedative before his first few visits to the dentist or at least until an understanding has been reached."

Some one of the following sedatives taken by mouth will be found very useful. The dosage varies according to the weight of the child. The drug is given forty-five minutes before the appointment.

Amytal: 1½ to 2 grains (½ tablet).
Sodium amytal: 1½ to 2 grains (½ capsule).
Luminal sodium: ½ grain.
Pentobarbital: ¾ grain.
Codeine: ¼ grain.

If a dentist can develop his skill to a point where he has as complete confidence in his ability to practice for children as he has to practice for his adults, he will unconsciously transmit this confidence to the child, their relations will be pleasant, and both child patient and operator will gain mutual satisfaction that the work has been done as well and as painlessly as is possible. The child will continue as a regular patient, well-behaved, because his dentist has eliminated his fear of pain by his operative procedures.

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AROUND THE COUNTRY—

We wish to extend our best wishes to Dr. J. R. Thompson, formerly of Lincoln, Nebraska, who has accepted the appointment as Director of the Department of Pedodontics, at Baylor College of Dentistry, Dallas, Texas. Dr. Thompson leaves his position as Director of the Division of Dental Hygiene of the Nebraska State Department of Health with the good will and esteem of the many friends he made throughout that State during his tenure of office.

John Brauer, now Lt. Colonel Brauer, is situated at 4405 Underwood Street, University Park, Maryland. We understand John almost had Walter McBride persuaded to join him in his public relations work with the army.

Howard Burkart, formerly Director of the DeLos G. Hill Dental Clinic, and head of the Department of Children's Dentistry at Atlanta—Southern Dental College, has moved to Coral Gables, Florida, where he will enter private practice.

Our friend, Bill Davis, of the Michigan State Department of Health was recently elected President of the Michigan State Dental Society, so we may be sure that dentistry for children will continue to occupy its fair share of attention in the programs of that Society. Bill turned over the editorship of the Bulletin of the State Dental Society to Walter McBride with the June issue of the magazine.

Walter J. Pelton of the Surgeon General's staff has been very successful in his drive for members in the Dental Section of the American Public Health Association. We're sure that if Walter would enclose a photograph of himself in uniform, along with the application blank, that few prospects, especially of the opposite sex, could resist the invitation!

Our busy Secretary, Mott Erwin, in addition to conducting his private practice, is engaged as a full time instructor at the North Pacific Dental College. More reason for you to cooperate with him in his efforts to keep the Secretary's office running smoothly.

Captain Samuel Stulberg, erstwhile assistant to Ken Easlick at Ann Arbor, and more recently a prominent pedodontist in Detroit, Michigan, is now stationed at Finney General Hospital, Thomasville, Georgia. His interest in dentistry for children is becoming more intense, since the arrival of a son some weeks ago!

We are greatly pleased to enter the subscription of R. M. Siman, Dental Surgeon of Nicosia, Cyprus whose request reached us early in July, although mailed from Cyprus March 27th. Spurred by the strange pictorial views on the stamps, (which we have turned over to a numismatist friend) the postmarks, and censor seals acquired during its course of travel, we turned to our Encyclopedia to learn that Cyprus is an island under British protectorate in the Mediterranean. Its population at the time of record was some 300,000, mostly Greeks. We hope that when Dr. Siman receives this copy of the Journal, he will write us and tell our readers something of himself, his surroundings, and his practice.

In the future, this page will be conducted by Stan Brown. Please direct items of interest to him at Ithaca, Michigan.

What the General Practitioner Should Know About Orthodontics*

ALLAN G. BRODIE, D.D.S., Ph.D.
Professor and Head of Department of Orthodontia, University of Illinois College of Dentistry, Chicago.

Question:

What are the classifications of malocclusion? Briefly describe each.

Answer:

There are only two classifications in use in this country today, viz., the Angle Classification and the Simon. The latter would not be apt to be employed by the general practitioner since it requires considerable special apparatus. It is sufficient for the present purpose to say that it attempts, by anthropological means, to relate the dentition to the head.

The Angle Classification is based upon the relationship assumed by the lower teeth to the upper upon eruption. The starting point is the maxillary first permanent molar which, in the absence of mutilation of the deciduous denture, is presumed to take a normal position in relation to the middle and upper face and to the cranium. The mesio-distal relationship assumed by the lower first permanent molar to the upper is thus reduced to three possibilities, viz., (1) normal, (2) distal, (3) mesial. These constitute the three major classes of malocclusion. It should be noted that buccolingual relations are ignored.

Class I: These cases embrace a wide variety of conditions but exhibit the one common characteristic of normal mesiodistal relation of the first permanent molars.

Class II: In these cases the mandibular arch is more than one-half of a cusp distal to the normal relationship. Such cases tend to divide themselves into two very distinctive divisions so far as the anterior teeth are concerned. In some, the upper arch is relatively narrow and the upper anterior teeth appear protruded. This is called Class II Division I malocclusion. It is generally associated with mouth breathing. In the other division of Class II cases the upper arch is more normal in width and the upper anteriors are retruded and frequently jumbled. This is called Class II Division II. In both Divisions of Class II the overbite is excessive, the lower incisors striking the mucosa of the palate.

Class III: In these cases the mandibular arch is more than one-half cusp mesial to the normal relationship giving the lower face a heavy protrusive appearance.

If the malrelationship of the molars is present on only one side the word "subdivision" is added to the classification. Thus there may be cases of Class II Division I, Subdivision; Class II Division II, Subdivision, or Class III, Subdivision. Obviously there can be no Class I Subdivision.

Question:

What constitutes a functional occlusion?

Answer:

Probably no two practitioners could agree on an answer to this question because of the differences in the values they would assign to the various factors involved.

At one extreme we would have those who would maintain that any arrangement of the

*From the Fortnightly Review of the Chicago Dental Society, April 1, 1944.

teeth that would permit a patient to handle a modern human diet without dying of gastro-intestinal disorders would constitute a functional occlusion.

At the other extreme would be those perfectionists who would insist that the teeth not only present a perfect interdigitation of cusps, normal contact point relations, normal degree of overbite but a pleasing appearance as well. Thus a single standard could not be set up for a functional occlusion.

Probably the most acceptable definition that could be given would be something like this: A functional occlusion should be the best occlusion that can be obtained for a patient within the limits of his or her inherited type, condition of dental structures and constitutional health.

Question:

What consideration, if any, is given the frenum labium, in those cases where it is the cause of separation of the central incisors?

Answer:

In the first place, it must be determined that the frenum is actually the cause of the separation. A space between the upper central incisors is a frequent phenomenon of the mixed dentition. It arises through the fact that the growth of the alveolar process is a little ahead of the eruption schedule of the teeth. It is therefore difficult to determine whether the frenum is the effective agent before the completion of the descent of the permanent maxillary canines.

If a space remains after this time and of all other contacts are closed it may be assumed that the frenum is at fault. In such cases the central incisors should be brought together by means of a simple orthodontic appliance. (Rubber elastic traction should never be used.) This will result in a "balling-up" of the mid-line interproximal tissue. The centrals should then be released for about twenty-four hours from the force that has brought them together. This permits a certain degree of relapse with a consequent replacing. Now the interproximal tissue should be carefully dissected away, either surgically or by cautery, care being taken to remove the frenum from well to the palatal side to well on the labial side. The epithelial edges should be sutured if the excision has been made surgically and the teeth once more tied firmly together, this time for a period of weeks.

True frenum separations are relatively rare, the author having seen only one operable case in eighteen years.

Question:

In what type of case is orthodontic treatment indicated in deciduous dentitions?

Answer:

There is considerable difference of opinion among orthodontists on this question. In the author's opinion the two outstanding types of cases that should be treated as early as possible are the Class III, or protruding lower jaw, and the completely inlocked mandible. The latter is frequently a Class II malocclusion but its distinguishing characteristic lies in the total lack of occlusal contacts between upper and lower arches. The buccal surfaces of the lower buccal teeth approximate the lingual surfaces of the maxillary buccal teeth when the jaws are closed. This permits an overclosure of the jaws during function and, by crowding the tongue back, sets up a gagging reflex. Such patients have difficulty with anything but a soft or liquid diet.

These same conditions should be corrected in the mixed dentition if they are first seen then and in addition there is another which only occurs upon eruption of the permanent incisors. This is the type of case where one or more of the upper incisors is caught to the lingual of its antagonist. This type of bite will almost invariably lead to a gingival recession on the labial side of the lower incisor that is involved, even in very young children.

Question:

What is the rural dentist's obligation over and above that of the city dentist in regard to orthodontic advice and treatment?

Answer:

Personally I cannot see that his obligation is in any way different from that of the city practitioner. In both cases it is an obligation to see that the patient receives good treatment just as it would be in the case of surgery, obstetrics or ophthalmology. The rub comes in the fact that the medical course lays a good foundation for the latter three special services while the dental course contributes very little toward a foundation for orthodontia. The country physician or the country dentist has the same training and background as his city colleague but he is frequently forced to work under less favorable circumstances and is hence sometimes more resourceful.

One would imagine that the country dentist, having no specialists to refer his cases to, would attempt to treat more malocclusions that the city dentist. Just the opposite is true. I have asked men in every small rural society before which I have talked whether they took any orthdontic cases and their answers were all much alike. "Emphatically 'no,' I do not dare take a chance on 'messing up' a case. In a small place like this the news of it would spread like wild fire and ruin my reputation." Another strong piece of evidence lies in the fact that there is less demand for orthodontic speakers in small rural societies than for any other lecturer.

I see no hope for the correction of these conditions in the near future. Unless the dental curriculum can be altered to serve as a better foundation for orthodontia the proper practice of this field will have to depend on postgraduate or graduate study. Groups of rural dentists, however, could provide good service for their patients by delegating one of their number, who is most interested, to obtain through training upon the understanding that the group would support him upon his return. This may sound Utopian, but actually it was a widely practiced procedure here in Illinois fifty years ago and rural medicine, with its group clinics, is coming to it more and more.

Question:

What mental preparation of the patient will assist the orthodonist to best advantage in handling a referred case?

Answer:

I do not believe any specific preparation is necessary. There are several things that should be avoided, however. As long as you are referring the case to someone else, do not express too many convictions about it yourself. For example, do not venture such statements as, "This is a simple (or complicated) case." "This case should be started immediately." "Such and such will have to be done in this case." The patient will almost invariably fail to tell the orthodontist that such an opinion has been expressed by the referring dentist until after the orthdontist has completed his records and has given his opinion. Then if it develops that the two opinions differ, doubt is cast on the knowledge of one or the other operator—usaully that of the general practitioner, since the specialist is presumed to be better informed on this particular phase of practice.

In any preparation of the patient every means should be employed to convey the correct impression of the relationship between the three parties, viz., the referring dentist, the patient and the orthdontist. A simple statement of this relationship would be as follows: "I believe the teeth of your daughter Mary should be straightened, and since I do not include this service in my practice, I should like to refer you to someone who has had special training and experience in it. He will probably wish to take certain preliminary records before he expresses a final opinion, but he will

then tell you what the treatment will entail in terms of appoinments, time and fee. He will have complete charge over all orthdontic work but I shall continue to take care of her dental work and we will consult together whenever it is necessary."

Avoid making guesses or estimates of what the orthodontist's fee will be—let him worry about that. The days of staggering fees are gone and your estimate, based on hearsay evidence, may embarrass you.

Question:

What answer can the dentist give when this question is asked? "Mary's teeth were nice and straight when the orthdontist finished, now they are crooked, why?"

Answer:

Ask the man who straightened them.

Question:

Are certain types of malocclusion more serious to the well-being of the patient then others?

Answer:

Yes, those that inhabit or limit normal function are more serious than those which do not. The most prevalent of these are the conditions which make mouth breathing necessary, since mouth breathing predisposes to respiratory disorders. This is particularly true in a city like Chicago where the atmosphere is saturated with dust and soft coal particles. A nose breather filters such air before taking it into the lungs—the mouth breather does not.

Reference has already been made to those conditions which lead to stripping of the labial gingival tissue. This would affect the local health of the mouth.

Then there is the matter of mental health and it is here that orthodontia probably does most for the patient. The boy who is made to suffer the taunts of his playmates because of his "buck" teeth and the girl who becomes a wall-flower for the same reason, must be looked upon as sick people. Their outlook on the world is frequently warped and their reactions are similarly affected.

Question:

What preventive measures, relative to caries, can be employed during orthodontic treatment?

Answer:

The association of caries during orthodontic treatment goes back to the days when arches lay in contact with naked tooth surfaces and wires, running interproximally, held the arch in place. With the advent of multiple, cemented bands the incident of caries has dropped to the place where it becomes a matter of good technique on the part of the orthodontist and good hygine on the part of the patient. A lack of either of these two, however, still makes the orthodontic patient more susceptible to caries than the child who is not encumbered by braces.

The responsibility of guarding the child during treatment in this regard must be laid at the door of the orthodontist. He must check his bands at each appointment to see that none is loose and he must instruct the patient in the technique of keeping both teeth and appliance scrupulously clean. Further than this he must see that his orders are obeyed or else remove his appliance. He should call the patient's attention to any suspicious areas which might indicate beginning caries and refer him to his dentist for final check.

Question:

Can the vertical dimension be successfully increased?

Answer:

Before answering this question it is necessary to define "vertical dimension." It is usually thought of as a height of the face with the

teeth in occlusion. But this is not the true vertical dimension. The true vertical dimension is the height of the face with the mandible at its physiological rest position and the teeth apart. The space between them is normally 2½-3 mm. In some cases, however, the jaws at rest will be found to be separated by as much as ⅜". In such cases the teeth may be elevated to within the normal 2½-3 mm. with success.

Question:

What is the acceptable age limit for adult orthodontia?

Answer:

There is no chronological age limit. The limitation is set by the physiological conditions of the periodontium and bone. Some cases at forty are better risks than others at twenty. Thin, poorly trabeculated bone is a poor risk at any age while dense, well trabeculated and calcified bone always seems to respond well.

Question:

Discuss the general practitioner's duty and obligation to the patient relative to ortho-

Answer:

I believe it is the dentist's duty to be able to recognize deviations from the normal in the developing and in the developed denture. This means that he should know the normal occlusion of the teeth, approximately when the teeth should appear, both radiographically and in the mouth, the different classes of malocclusion and the effects that may accrue from bad habits.

I believe his obligation is discharged when he calls the patient's attention to any condition he feels should be taken care of and refers the patient to a capable orthodontist if he does not care to handle it himself.

NEW YORK STATE SOCIETY OF DENTISTRY FOR CHILDREN

Once again, our New York unit has drawn the spotlight to its activities. On May, 11, 1944, this unit sponsored its Second Interstate Conference on Dentistry for Children, bringing together members from the states of New York, New Jersey and Massachusetts in an outstanding program of interest from both the scientific and practical viewpoints. Presiding officer was Robert L. Heinze, D. D. S., President of the New York State Unit, American Society of Dentistry for Children, who delivered the address of welcome and presented the following program:

Subject: Practical Aspects of Dentistry for Children.

Speaker: Walter E. Briggs, D. M. D. Attleboro, Mass.

Discussor: Floyd E. Gibbin, Buffalo, N. Y.

Subject: The Use of Fluorides to Control Dental Caries.

Speaker: David B. Ast, D. D. S. Albany, N. Y.

Discussor: J. M. Wisan, D. D. S. Dental Director, New Jersey Department of Health.

Table Clinic by Massachusetts Unit of American Society of Dentistry for Children represented by Doctors Harold Berk and Raeburn Davenport.

The following officers were elected to serve for the year 1944-45:

President: Dr. Elmer J. Pammenter, chief, Operative Division, Rochester Dental Dispensary.

President-elect: Dr. David B. Ast, Assistant Oral Hygiene Director, Albany, N. Y.

Secretary-Treasurer: Dr. William James Taub, Albany, N. Y.

THE CHILD IN YOUR PRACTICE*

J. R. THOMPSON, D.D.S., *President-Elect*
Nebraska Society of Dentistry For Children

It has been said and truthfully, that the children who seek the services of dentists today will constitute his adult practice tomorrow. That is, they will if they have received careful, efficient treatment at his hands and are made welcome in his office as are the adult patients. I hear you say, "But in this emergency, how can I possibly find extra time that practice for children necessitates?" I must reply, "You have no alternative in the light of recent knowledge and with the advance made in dental health education." Parents are becoming more and more dental health conscious and are demanding the same type of service for their children that they receive for themselves.

If the figures from the Guggenheim Clinic are accurate, 47% of children two years of age have cavities. Dentists as well as many well-informed parents, know that when cavities are discovered early and the teeth filled, the usual serious consequences will be avoided. The only answer to this problem is dental examinations at an early age and the correction of the defects found.

The sole purpose of dental health education is to transmit scientific facts on dental health to the public and to motivate an optimum of dental health from childhood through old age.

We cannot overlook the fact that much of the responsibility for this education rests upon the shoulders of the practicing dentists. Nowhere can dental attitudes and habits be built easily and urged with more sincerity of purpose than in the daily contacts that dentists have with child patients and their parents. For most children the attitude of the parents is the determining factor in the child's dental care.

If we are to teach children the right thing, we must first conclude what is right. Then we must be able to perform the service we urge them to seek.

As a result of the newer teachings of dental health by dental groups and public health agencies, it is difficult for school officials to understand why some dentists do not advise dental care for the deciduous teeth. A prominent school authority in Nebraska recently made these comments: "It would be advantageous to the dental health program in schools if representatives of local dental societies would contact local school officials directly, offering their co-operation in the dental program." He continued, "It is equally important that these dentists should make sure that the quality of the dental service rendered to children be on a par with the type of service rendered to the adult." The school official further stated that it is his observation that dental examinations of school children made in the office of the family dentist, rather than in the school room, give a truer picture of the dental needs of the children, and that the child is

*From the Journal of the Nebraska State Dental Association, March, 1944.

more likely to seek necessary corrections when so advised by his family dentist. Corrections are the ultimate aim of any physical examination.

Universal and continuous use of bite-wing radiograms is a widely accepted usage and yet in some dental offices, it is not yet a routine practice. Orthodontia is constantly being urged for the many malocclusions and alignment defects and yet only a small percentage of orthodontia cases are corrected. The public has been repeatedly told of the danger of abscessed teeth; yet some dentists still temporize with abscessed teeth if they have any strategic importance in maintaining space.

It is conceded that we cannot expect an improvement in the dental health of adults in the years that are to follow unless a better service is rendered to an increasing number of children in the dental practice of today. As a profession, we must carry on our efforts, in spite of difficulty, to give youth the best possible preparation for their responsibilities in the post-war world.

REPRINTS

Reprints of any article appearing in the Journal will be available for 30 days following publication. Cost is determined by the length of the article and the number of reprints desired. Inquiries should be directed to the Editor at 14615 E. Jefferson Ave., Detroit 15, Mich.

GENTLEMEN! MEET THE NE

A few months back the former editorial staff, Drs. Harris, Gibson, Easlick, and McBride, bent and hoary with age and with long service to the Journal, met to discuss the forthcoming issues. With chins in their hands they may have looked like thinkers and might have been mistaken for wise old fellows—but not an idea was born—not a thought came forth to improve or modify the quarterly editions.

A speaker once said there are times when his mind was so blank you could throw a cat through it without scratching an idea. In this instance there were four such idea-less individuals. Finally 'twas mutually agreed that perhaps we had served too long and possibly a change of personnel might be beneficial. Accordingly, a letter was dispatched to President Ireland carrying four resignations together with the submission of four other names to fill the vacancies for his and the executive council's approval..

The retiring board did not wish to appear presumptuous in presenting the candidates for the new staff. It was done only in a spirit of co-operation with Dr. Ireland who might find it difficult in the absence of the annual meeting to select and nominate a staff suitable to all. On the home front, here in Michigan's Pedodontic Eden, there were men who had been tried and would of a certainty not be found wanting. The Executive Council has accepted the candidates as presented and has duly elected them editor, and members of the editorial board:

Alfred E. Seyler, the new editor, is Director of the Children's Clinic of the University of Detroit School of Dentistry and has been associated with that department since 1934. He is a graduate of Marquette University. He is a past president of the Michigan Society of Dentistry for Children and of Nu Nu Chapter of Omicron Kappa Upsilon, Dentistry's honor society, and has faithfully served as chairman of the Radio, and Public Health and Education Committees of the Detroit District Dental Society for a number of years.

James N. Gasaway, chairman of the board, is Kansas born, a Navy veteran of World War I, a graduate of Kansas City Western Dental School and also of the Detroit College of Law. He holds the degree of Master of Science of Public Health. For a number of years Jim has been the right bower in the dental division of the Children's Fund of Michigan and serves as monitor for every candidate who is accepted for service in the Children's Fund. Because of his straightforwardness, Jim has been good ballast for children's dentistry in Michigan.

Stanley Brown is dentistry's oracle in his native parts, Ithaca, Michigan. Children's dentistry has no better or wiser champion than Stan, either in his office or on the printed page. He has a combined practice of children and adults but cares for the latter only as a matter of necessity, for his interest is in the

THE NEW EDITORIAL STAFF

children. Without dentistry, he is a great Rotarian and has compiled a rather lengthy organization manual for embryo Rotary clubs. He reads voluminously, writes in the same fashion and goes to every dental meeting he hears about. Accordingly, he has a good idea of what is going on and what is good or bad in dental journalism.

C. Ray Taylor, a native South Dakotan, is a graduate of St. Louis Dental School. He practiced for a number of years, then becoming public health minded, took his Master's degree in public health at the University of Michigan in 1939. Rather than let a good man slip through their fingers, the Michigan State Health Department conscripted him as its Assistant Director of the Dental Division in which capacity he is now serving. Ray, together with an educational consultant, was the editorial backbone of the book entitled, "Your Child's Teeth," published recently by the A.D.A.

This new magazine looks like a good start in the right direction. Let's give the boys a good hand.

WALTER C. MCBRIDE,
Chairman of the Retiring Editorial Board.

- - - and now that you have met your new editorial staff, *we* would like to meet *you*, and to have your opinions as to what kind of a Journal you would read. We said *"read"*—not merely inspect casually and toss to the back of the desk until your assistant makes her regular disposition of the debris on the desk top.

We have read copies of this Journal dating back to 1934, some of them with a great deal of interest in their contents, other because we were trying to analyze the magazine itself, and our conclusion is that we like a magazine to be more than just a digest of the scientific articles which pertain to dentistry for children. We think you would like to know what has become of some of those whose names figured so prominently in the early activities of the Society, and what they are doing to keep themselves and dentistry for children on a progressive basis. We think you would like to know about our members who are in the Armed Services, and occasionally to learn what other countries are doing about dentistry for children. We think you'd like to have published once a year, a roster of our membership, and to have us tell you what the various state units are doing to keep their membership actively interested, with perhaps a sample program which was well received. Would you?

Lastly, the Journal will be only as good and readable as you readers and contributors help us to make it. If you have written or read something you think would be of interest to the members of the American Society of Dentistry for Children, send it to us, and if the Editorial Board agrees with your opinion, we'll print it. Give us time to get the feel of the harness, and some material aid by your criticisms, constructive or otherwise. A.E.S.

Conference on Dental Health Economics

Under the direction of Kenneth Easlick, prominent A. S. D. C. member and perspicacious pedagogue of pedodontics, the University of Michigan School of Public Health presented, from June 26 thru July 1, 1944, an "Institute on Dental Health Economics." Purpose of the Institute was to bring together a representative group of leaders in the dental health field in order that they might share their experiences and pool their thoughts on the improvement of the dental health of the American people. The Institute was intended to review briefly the social and economic background of health problems, and against this setting to develop a comprehensive understanding of the dental problem.

Committees presented reports on the following subjects:

The Dental Needs of People (children, adults).

Availability of Dental Services (urban and rural, age groups, racial).

Professional Education.

Ability of Public to Pay for Service.

Recommendations for Minimum Standards of Dental Health Service. (Children and Adults).

Solution of Problem of Personnel.

Organization of Payment for Services (childrens's adult's).

Minimum standards of dental health service were established by these committees and then concise information was presented to assist in the development of a plan to solve the dental problem at this level of standards. The work of the Institute culminated in concrete proposals for a dental health program designed to meet the challenging needs which are known to exist.

Prominent A. S. D. C. members who participated in this educational project were:

J. O. McCall, Director, Guggenheim Dental Clinic, New York City.

J. M. Wisan, Director, Dental Health Division, State Department of Health, Trenton, New Jersey.

W. J. Pelton, Dental Surgeon, States Relations Division, U. S. Public Health Service.

Walter H. Phillips, Director, Dental Division, City Department of Health, Detroit, Michigan.

John W. Knutson, Dental Surgeon, U. S. Public Health Service, Minneapolis, Minn.

W. R. Davis, Director, Bureau of Public Health Dentistry, Michigan Department of Health, Lansing, Michigan.

E. W. Morris, President, W. K. Kellogg Foundation, Battle Creek, Michigan.

C. R. Taylor, Assistant Director, Bureau of Public Health Dentistry, Michigan Department of Health, Lansing, Michigan.

Post-War Implications of Fluorine and Dental Health*

The Use of Topically Applied Fluorine

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and
WALLACE D. ARMSTRONG, M.D., Ph.D.
Professor of Physiological Chemistry, Laboratory of Dental Research and Division of Physiological Chemistry, University of Minnesota, Minneapolis, Minn.

Present knowledge and trends of evidence on the relationship of fluorine and dental health indicate that the incidence of dental caries can be reduced by either of two methods of fluorine therapy. These methods are: (1) the addition of 1 part per million of fluorine to municipal water supplies; and (2) the topical application of fluoride solution to the teeth. It is the purpose of this paper to present experience with and to discuss the relative usefulness of the second method of fluorine therapy.

The first published reports on the use of topical application of fluoride solution to the teeth of humans were made in 1942 by two independent investigators. Bibby[1] reported on the application of 0.1 per cent sodium fluoride solution to the permanent teeth of 89 children aged 10 to 13 years, and Cheyne[2] reported on the application of 0.05 per cent potassium fluoride solution to the deciduous teeth of 27 children aged 4.5 to 6 years. Both of these investigators concluded that the treatment effected a 50 per cent reduction in the incidence of dental caries. In a subsequent report on the second year of observations on the caries experience in his study group, Bibby[3] concluded that the effectiveness of the treatment had decreased slightly.

The most recent report on experience with topically applied fluoride was made by Knutson and Armstrong,[4] who obtained a 40 per cent reduction in the yearly incidence of dental caries by using a 2 per cent solution of sodium fluoride.

A summary of the major findings of this most recently reported study on the topical application of fluoride to the teeth is as follows:

1. The treatment described effected a 40 per cent reduction in the incidence of dental caries during the first year following treatment. The treatment was appreciably more effective in preventing caries in the upper than in the lower teeth.

2. The treatment was of questionable value in inhibiting caries extension on the noncarious surfaces of previously attacked teeth. There was no evidence that the treatment effected an arrest of active caries.

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*Condensed from the American Journal of Public Health.

3. During the first year after treatment, the caries inhibiting effect was confined to those teeth to which the fluoride solution was topically applied.

Before proceeding to a discussion of the usefulness of the topical application of fluoride to the teeth, it must be admitted that at present the total experience with this method for obtaining reduction in the incidence of dental caries is very meager and merely sufficient to encourage further study. However, the results of these preliminary tests have given rise to the conviction that the effectiveness of this type of therapy can be improved markedly. Therefore, in order to limit the present consideration of the relative usefulness of topically applied fluorides in postwar dental health programs, this discussion will be based on the pessimistic assumption that the current indications of the prophylactic effect of the two methods of fluoride therapy will be established at the current level of apparent effectiveness and that other more efficient methods will not soon be available for use.

It has been demonstrated by Dean and his coworkers[5] that approximately 1 p.p.m. of fluoride in communal water supplies is associated with a 50 to 65 per cent reduction in the prevalence of dental caries. For the purposes of this discussion, this level of prophylactic effectiveness is accepted as the expected result of the purposeful adjustment of municipal water supplies to a fluoride concentration of 1 p.p.m. Under the foregoing assumptions it is obvious that fluoride added to water supplies is more effective in preventing dental caries than fluoride applied topically to the teeth. Furthermore, a program based on the addition of fluoride to municipal water supplies is far less costly and far less difficult to administer than one based on individual therapy. Nevertheless in considering a program for an over-all reduction of dental caries in this country, the topical application of fluoride to the teeth cannot, for several major reasons, be dismissed as only of academic interest.

First, in order to obtain the full caries-inhibiting effect of fluoride bearing waters, it is necessary that the individual depend on such supplies for his ordinary purposes of water consumption during the first 8 years of life, or during the period when the teeth (excepting third molars) are being calcified. Thus this method is of direct value to future populations only. On the other hand, the topical application of fluoride affords a preventive measure for use on the teeth of present populations.

Second, if all municipal water supplies in this country were adjusted to contain 1 p.p.m. of fluoride, approximately one-third of the population would not be covered by this form of fluoride therapy. Among that third of the population dependent on private wells or other supplies for their source of water,[6] the topical application of fluoride is a useful substitute method.

Third, since neither method of fluoride therapy is a complete dental caries prophylaxis, a periodic dental examination for the early detection and treatment of those teeth which become carious will continue to be an important health service. The topical application of fluoride to the teeth could be routinely administered with each periodic dental examination. This possibility, together with the desirability of treating teeth with fluoride soon after eruption, reduces the importance of the problem of multiple treatments. Since, for example, the eruption of the permanent teeth occurs largely during the age span 6 to 13 years, the treatment of each annual crop of newly erupted teeth would afford an opportunity to submit previously erupted teeth to renewed treatment. Furthermore, the ability to secure a concrete preventive service may constitute an important incentive for obtaining periodic dental

examination and the early correction of carious and other dental defects.

There is at least a theoretical possibility that a few individuals will develop mottled enamel from fluorine-treated waters, whereas this result is not possible through the use of topically applied fluorine. However, this comparison will not be used here to discredit the former method of therapy and favor the latter. There is no evidence that 1 p.p.m. of fluoride in the communal water supplies produces dental fluorosis of esthetic importance to the individual or that it produces deleterious effects of any health significance; it is known that higher concentrations produce both. However, the danger of overdosage is common to many of the forms of therapy in extensive use today. Therefore, an indictment of the fluorine treatment of waters on the basis of our present knowledge of the dangers of overdosage does not seem reasonable.

From the foregoing considerations, the general conclusion is that the topical application of fluoride to the teeth is very likely to afford a method of practical usefulness for reducing the incidence of dental caries in the populations of the past-war period.

SUMMARY

A review of the reported experience on the dental caries-inhibiting effect of topical applications of fluoride solution to the teeth has been presented. Present indications are that the incidence of dental caries can be reduced approximately 40 per cent by this method of fluoride therapy.

Although it is highly probable that a 50 to 65 per cent reduction in dental caries can be accomplished by the simple addition of 1 p.p.m. of fluoride to domestic water supplies, the topical application of fluoride to the teeth affords a useful adjunct or substitute method for obtaining a somewhat smaller reduction in the incidence of dental caries. There is a particular usefulness of the topical method of therapy to present populations and to that third of the population dependent on private wells for their water supplies.

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Post-War Implications of Fluorine and Dental Health*

The Problem as It Relates to the Water Works Engineer

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Progress made in the investigation of the fluoride content of water supplies and its relation to dental decay is being followed with much interest by the water works profession since it appears probable that a whole new problem will be placed in their lap for solution. The problem, of course, concerns the reduction of dental decay by the application of sodium fluoride to fluorine deficient public water supplies, and concurrently the prevention of mottled enamel by the reduction of the fluoride content of those supplies that exceed the optimum amount.

The *reduction* of the fluoride content of a water supply to an optimum amount may be difficult and expensive. To my knowledge there are no public water supplies in the country now being treated for the reduction of fluorides. In water softened with lime, a certain reduction in fluorides is reported by Scott, Kimberly, Van Horn, Ey, and Waring,[1] and Elvove[2] reports successful removal of fluorides in laboratory experiments with the use of calcined magnesite and light magnesium oxide. Removal of fluorides from potable water by tricalcium phosphate has been reported by Adler, Klein, and Lindsay.[3] Wherever possible, the best solution to the mottled enamel problem still appears to be the changing of the source of supply to one that contains 1 p.p.m. or less of fluorides.

Editor's Note—

We include this discussion of the fluorine question because it offers a view of the practical side of the problem with which we should be acquainted if we are to be active proponents of fluorine therapy in the community in which we practice.

The *application* of sodium fluoride to fluorine deficient public water supplies for the reduction of dental decay should not prove a difficult problem. Many supplies are now being treated for the reduction of hardness, clarification, taste and odor control, disinfection, corrosion control, color removal, stability, etc., so that chemical feeding equipment and control measures are well established and widely used. Also, much of the personnel responsible for water quality and treatment is highly trained. It is obvious, therefore, that should a program for applying fluorides be established, those supplies now receiving treatment under local laboratory control would have little difficulty in applying an additional chemical. Most of these supplies would need only additional chemical feed equipment to establish the treatment.

The control of the application of sodium fluoride should not be confined to the accuracy of the feeding equipment, but should be dependent on the results of a test for fluorine in the treated water. Such a test should be simple in procedure, accurate to 0.1 p.p.m. of fluorine, and expeditious in results. A colorimetric test is needed with permanent standards that can be used by water plant operators having little or no technical education. A test kit similar to that used for determining residual chlorine would be desirable. Present test procedure as outlined in *Standard Methods of Water Analysis, Eighth Edition,* uses temporary color standards and requires 18 hours for the completion of the

*Condensed from the American Journal of Public Health.

test. This test would, therefore, be unsuited for general application.

Until a new and simplified test with permanent color standards is available, the application of sodium fluoride to public water supplies should logically be limited to those supplies having local laboratory control by technically trained personnel.

It has been my experience with water supplies in Michigan that many of them contain small amounts of fluoride (F), usually varying from 0.1 to 0.5 p.p.m., and in a few cases, slightly higher amounts. Obviously if a water supply were to be treated with sodium fluoride to 1 p.p.m. or any other predetermined amount, the natural or residual amount in the untreated water must be known and taken into consideration when computing the chemical application. It is apparent, therefore, that before the fluoride treatment is established on any supply, one or more analyses for fluorine in the untreated water are essential. Otherwise there would be an excellent opportunity to overtreat the water which may be sufficient to cause mottled enamel.

An attractive feature of the fluoride treatment of water supplies is its small cost, which is partly due to the application of only 1 p.p.m., and partly to the low cost of sodium fluoride which is quoted at 7 cents per lb. Since commercial sodium fluoride is 90 per cent pure, an application of 1 p.p.m. of fluoride (F) would require 20.5 lb. for each million gallons of water treated. Applying these figures to a town with a population of 7,500 and using an average of 1,000,000 gallons of water each day, the total cost for the fluoride treatment for a full year would approximate $567. This figure includes the cost of the chemical, the chemical feeding equipment prorated over ten years, and the cost of a fluorine testing set, but does not include the cost of any labor, since no additional help would be required. On a per capita basis the annual cost of the treatment is about 7½ cents, and for a family of four the annual cost would approximate 30 cents.

It is indicated in survey data presented by Dean, Arnold, and Elvove[4] that the number of permanent teeth showing dental caries experience per 100 children examined, using water supplies with fluoride (F) concentrations between 1 and 1.4 p.p.m. was roughly 39 per cent of that found in children using water supplies containing fluoride (F) concentrations of less than 0.5 p.p.m. Likewise the findings for similar groups of children using water supplies containing fluoride (F) concentrations between 0.5 and 0.9 p.p.m. was roughly 54 per cent of that found in children using water supplies containing fluoride (F) concentrations of less than 0.5 p.p.m. From these data it could be concluded that approximately a 50 per cent reduction of dental caries in the permanent teeth of 12 to 14 year old white children is obtainable with the use of a water supply containing 1 p.p.m. of fluoride (F). This means that the annual dental bill for the restoration of decayed teeth in children of this age group can be cut in half. Of course, the fluoride treatment of water supplies means much more than this since all age groups will be benefited, but to what extent must first be determined before a complete cost analysis can be prepared.

Even though the benefits of the treatment are evident from a public health and a financial viewpoint, it is still prudent to consider the legal responsibilities that a town or private utility accepts when it establishes the fluoride treatment of a public water supply. With that thought in mind, Dr. H. Allen Moyer, Commissioner, Michigan Department of Health, asked the Attorney General of Michigan for an opinion on the following question:

Could the owner (either a municipality or a private utility) of a public water supply be held liable for damages in the event that the supply was treated with fluorine and one or more customers developed mottled tooth enamel which they claimed disfigured their appearance or structurally weakened their teeth or made some similar complaint?

The Attorney General's opinion follows:

The general rule of liability as to private utilities in furnishing water for public domestic use has been summarized as follows: "A water supply corporation is not an insurer of the purity of the water furnished by it for public consumption, or of its freedom from infection, but is bound to use reasonable care

and diligence in producing pure and wholesome water that is at all times free from any infection or contamination which renders the water unsafe and dangerous to individuals, or unsuitable for domestic purposes, and is liable for injury resulting from its failure to do so."

The same rule is generally held applicable to municipal corporations.

Before liability could be established it would be necessary that the plaintiff show negligence on the part of the utility or municipality furnishing the water and show that his injuries resulted from such negligence.

However, it is possible that liability could be established were it shown that through some negligence in treatment quantities in excess of one part per million were introduced from which damage resulted.

This opinion restates the responsibilities for which a water utility has always been accountable. In other words, the addition of fluoride to a supply does not increase or decrease those responsibilities. The opinion also emphasizes the need for a standard procedure for the control of the application of fluoride.

A request for an opinion on the following question was also made:

Assuming that the treatment was originally started for the benefit of the public health and admitting that the treatment of a public water supply with fluorine is mass therapy, could a local citizen who objected to the practice of treatment from a personal angle, but whose teeth were not damaged by the treatment, stop such treatment of the water supply.

In reply to this question the Attorney General's opinion was:

Assuming the authority of a municipality to add fluorine to its public water supplies, there would be no method by which a citizen not injured by but not sympathetic to the program could enjoin such treatment.

Finally, I believe it imperative that should the fluoride treatment of public water supplies be adopted that the state health departments should exercise supervisory control over the treatment in much the same manner now used in respect to the other types of treatment. Such control should include as a minimum, an annual inspection of all treatment plants by an engineer of the department, the submission of monthly reports on the operation of the water treatment plants to the health department, and, finally, and most important in my opinion, the establishment of a certification or licensing system which would insure competent and trained personnel to be in charge and responsible for the treatment wherever it is practiced.

SUMMARY

The *reduction* of fluoride in a supply to an optimum amount for the prevention of mottled enamel may be difficult and expensive. Changing the source of water supply to one containing less fluoride still appears to be good practice.

Adding fluoride to fluorine deficient water supplies for the reduction of dental decay should not prove a difficult problem, since accurate, durable, and inexpensive chemical feed equipment is available. The supplies that are now under local laboratory control with technically trained personnel could institute the fluoride treatment with very little new equipment. A quick, accurate, and simple test for fluoride (F) having permanent color standards is needed, however, before the treatment should be approved for general application. The cost of the treatment is small, averaging about 7½ cents per person a year. Legally, the responsibility of a water utility applying fluoride to a supply remains unchanged. Negligence in treatment which results in damage must be shown to establish liability. Supervisory control of the treatment by state health departments is desirable.

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When Should Orthodontic Treatment Be Started!*

L. B. HIGLEY, D.D.S.
Department of Orthodontics, The State University of Iowa, Iowa City, Iowa

Question:

What type of case should be corrected in the deciduous dentition?

Answer:

When to treat undoubtedly necessitates as broad a background of orthodontic knowledge as any problem that confronts the orthodontist. It must be remembered too that treatment is not similar for all cases but ranges from advice to complicated mechanical or surgical procedures. Most cases during the deciduous or early mixed dentition stages will permit an observation period during which the etiology may be determined more accurately than if treatment is instituted immediately. Also the rate of change, either toward improvement or increased severity of the deformity, may be judged. Some cases need immediate treatment[1] and no observation period is indicated. However, for the more usual cases, after a suitable observation period, the following types of deformities should be treated in the deciduous denture stage:

a. Cases in which an etiologic factor is discovered which if not eliminated will produce or enhance an incipient deformity.

b. Cases in which caries or accident has caused early loss of deciduous teeth.

c. Cases in which roentgenograms have shown that certain permanent teeth are not forming.

d. Cases in which incorrect tooth relationships may lead to deformity of the osseous support, especially if it would extend to include the basal bone.

e. Cases in which incorrect tooth relationships cause the mandible to shift forward, backward or to one side into a convenience bite.

Question:

What type of case should be corrected in the mixed dentition?

Answer:

The conditions enumerated for the deciduous dentition would also apply to the mixed dentition but in addition the following conditions peculiar to this stage of dental development should be treated, as:

a. Cases in which the first permanent molars or certain bicuspids are locking incorrectly with the teeth of the opposing dental arch.

b. Removal of supernumerary teeth. (Occasionally necessary in the deciduous dentures.)

c. Cases in which close bite shows no improvement as the permanent teeth erupt.

Question:

What type of case should be corrected after the bicuspids and canines have erupted?

Answer:

This question might be answered facetiously by saying only such cases as we have been unfortunate enough not to have seen previously. All the conditions mentioned in the answers to questions 1 and 2 would be treated at this time except for those not applicable to this stage of dental development. However, the only deformity that may be put off until this stage is one confined entirely to malocclusion of the teeth and which does not materially affect the supporting or basal bone.

Some cases, especially certain types of Class II Angle in which the basal bone is not deformed, respond well to treatment when it is possible to include the biscuspids and canines in the application of the corrective device but since such cases usually do involve deformity of the basal bone, it is best not to put off treatment until this time.

*Condensed from the Fortnightly Review of July 15, 1944.

Question:

Of what value are dental X-rays in determining the time of treatment?

Answer:

Dental X-ray pictures are of value in a number of ways in determining the time for treatment. Caries, disclosed by them, should be cared for before treatment is attempted. If the X-ray pictures are taken early it may be found that certain permanent teeth are not forming and treatment may be indicated immediately. But, if the X-ray pictures are not taken until a later time, this absence of a permanent tooth will not be discovered and a different plan and perhaps a decidedly different time for treating the condition will be selected. The position and amount of development of certain permanent teeth and the resorption of deciduous roots will often influence the time of starting treatment. Alveolar bone structure, presence of supernumerary teeth, and the results of pathologic conditions of the investing tissues may also be seen and their influence upon treatment time judged.

Question:

Are the forming permanent teeth influenced by moving their deciduous predecessors?

Answer:

Breitner[2] and others have shown experimental evidence that orthodontic movement of the deciduous or mixed dentition produced migration of underlying and adjoining tooth germs. Much clinical evidence supports these experimental findings. This means that expansion of the deciduous arches, when done properly, will have a lasting effect upon the permanent dental arches.

Question:

What information that will be of value in treatment can be compiled by observing a case for some years previous to treatment?

Answer:

Observation of a case previous to treatment will allow the operator to determine the etiology more accurately, decide whether the condition is improving or getting worse and at what rate, judge the interest of the parents and patient in having treatment and thus predict the cooperation that may be expected. All this will lead to the selection of the most opportune time to begin treatment.

Question:

What factors other than those pertaining to the malocclusion influence your decision as to when treatment should be started?

Answer:

Systemic conditions, rampant caries and other oral pathologic conditions influence the decision as to when treatment should be started. Oral pathology is usually a manifestation of a systemic condition which if not eliminated may make a satisfactory orthodontic result impossible. Indifference or lack of cooperation on the part of the parents, patient, or both may make it advisable to put off treatment. Availability of the patient is also important. The stage of dental development may allow or prevent treatment at a given time. The operator's time is also important as he should not attempt to treat more cases than he has time to devote to them.

Question:

When is an intermittent plan of treatment desirable?

Answer:

All early treatment should be intermittent. When possible the plan is to eliminate the etiology, correct the deformity, and establish natural conditions that will allow uniform growth, after which nature is permitted to work unhampered. In certain cases streamlined retainers may be needed between periods of active treatment. The hope is, and it is often realized, that a single early treatment may establish growth potentials that will suffice and no further treatment will be necessary. Attempts to stimulate growth beyond that expected for the patient's age should be avoided.

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THUMBSUCKING

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It has been only within the past twenty-five or thirty years that infant and child care have been placed upon a scientific basis. During that period, the pediatrician, child psychologist and other specialists in child care have developed. Scientific studies have been made of the many phases of child growth and development. In this highly specialized age, babies have been regimented, more or less. They have been placed on the rigid, "by-the-clock" feeding schedule and regular sleeping hours regardless of the individual baby. Mothers have been instructed by nurses and others that babies must not be rocked or fondled and the mother who had a thumbsucking baby was just not a scientific mother.

Prior to this highly specialized era, mothers had nursed their babies as often and as long as it was convenient for them to do so. Babies who did not naturally suck their thumbs were often encouraged to do so. Mothers thought this was a sign of a good baby. Now mothers are in a dilemma. So much emphasis has been placed upon the harmful effects of thumbsucking that they now know not what advice to follow.

Many articles have been published by physicians and dentists about the harmful results of the thumbsucking habit but most of the ideas were based on personal opinions rather than any scientific studies.

In more recent years members of the dental profession have made interesting studies of the relationship of the thumbsucking habit to malocclusion of the teeth and jaws. Psychologists and psychiatrists have developed a more generous attitude toward the thumbsucking habit and consider it as a natural tendency and harmful only on an individual basis, when associated with other factors in the child's growth and development. Many orthodontists agree that if the thumbsucking habit persists beyond a reasonable age of infancy or preschool, it causes malformation of jaws, palate and teeth. Studies have shown that the position of the child's hand while sucking the thumb might determine the type of malocclusion.

Swinehart[1] readily accepted thumbsucking as a major cause of malocclusion after he made a study of thirty-eight thumbsucking children. In his study he determined the percentages of the different types of malocclusion associated with the habit. Others who have made studies of the relationship of thumbsucking to malocclusion are Hellman[2] in 1921, and Lewis[3] in 1939. The results of both studies would indicate that there might be a definite relationship between the habit and malocclusion. However, Lewis indicated that if the habit were discontinued before the fifth year there was little likelihood of a permanent malocclusion, but if the habit persisted the deformity persisted.

Johnson[4] made an interesting study of a group of 898 children. In this group of children with malocclusion 17.49 per cent showed evidence of thumbsucking. He felt, however, that all of the cases of malocclusion were not due to thumbsucking. Johnson does not support Lewis in his contention that the malocclusion will correct itself if the habit is discontinued before the fifth year, but feels that it is advisable to correct the habit very early. He concludes that thumbsucking may be an etiological factor in malocclusion of either the deciduous or permanent teeth.

Moore [5] feels that one month's uninterrupted practice of thumbsucking indicates that the practice has become a habit. The earlier the habit is broken the simpler will be the task of breaking it. He states that orthodontists' opinions are based upon experience with many cases in which the habit has continued long past the age of five years. It has then become an integral part of the child's physical and psychological behavior pattern. He recommends that the tendency to thumbsucking be checked as soon as it manifests itself in infancy and, if necessary, mechanical restraint be used.

In a conference[6] on thumbsucking, a number of specialists in the various fields of child care and development gave some practical ideas about the habit of thumbsucking. Margaret Fries, who is both a pediatrician and psychiatrist, stated that in infancy, thumbsucking was an entirely normal act for a certain amount of time. The thumbsucking instinct is so strong that there is good evidence that the infant sucks its humb in utero. She feels that specialization in modern medical practice and unsatisfactory parent-child relationships are the two main reasons that the child sucks his thumb beyond the stage of infancy. After the stage of infancy, thumbsucking becomes a symptom of an emotional problem. Advice for the relief of the anxiety rather than the symptom would give more constructive help to both parents and child. The mother has a responsibility to maintain a calm and happy parent-child relationship.

Kanner[7] gives a psychiatrist's point of view when he states that thumbsucking is one of the earliest forms of habitual manipulation of the body. As a habit, finger sucking is almost always acquired in the first year of life, and it is only after the inhibitions of the hand to mouth reactions that sucking becomes an undesirable habit. The degree of the seriousness of the habit depends upon the circumstances accompanying the individual case. There are certain factors to be considered as guides in study or treatment of a case of thumbsucking. The age of the child while indulging in the habit is one factor to be considered. There is no cause for alarm if the habit is practiced by a healthy and well developed infant during the first two years of life. The longer the habit continues the more it assumes the characteristic of a personality disorder. There may be local damage to the mouth and fingers. The fingers may become flattened from constant pressure and the child may develop stomatitis. Kanner also views the habit from an esthetic point of view if the habit is continued beyond the stage of infancy. Parents may condone the habit in the child but teachers and playmates may tease or ridicule him. He may then resort to the habit in solitary places unobserved by others. Thus, an element of secrecy and sneakiness enters into the child's personality. Again there may be the reverse situation. Some mothers encourage the habit in children because the child is usually quiet and requires none of the mother's attention. The child gets the idea that he is considered good as long as he occupies himself with the thumb but "gets on mother's nerves" if he does anything to disrupt what she may be doing. The treatment of thumbsucking is the treatment of the thumbsucking child. Kanner does not approve of the use of any mechanical restraint unless the child is old enough to cooperate and shows a willingness to do so.

Mitchell[8] agrees with Kanner that thumbsucking is natural in infancy, but that the normal child under conditions which promote his all 'round growth, development, learning and adjustment, seldom continues thumbsucking beyond the second year. Infant behavior is motivated by physiologic needs and internal and external sensory experiences. These needs are supplied by his associates and his socialization takes place only under environmental circumstances. If at this stage of his socialization the child is met by frustration and repeated unpleasantness he tends to withdraw from such experiences and regresses to infantile pleasurable experiences, among which is thumbsucking. It is reinforced by the fact that the mouth is on of the three centers of the body where the greatest number of nerves end, and is herefore extremely sensitive to stimuli that brings preasurable sensory experiences. The constructive education of the parent is the clue to the discontinuance of the activity.

Fagre[9] agrees also that sucking is a natural instinct in infancy but when thumbsucking reaches the stage where it becomes a habit it is due to an unsatisfied sucking instinct in the baby's feeding regime or an unsatisfied emotional need. The baby may be tired, hungry or lack attention. It is useless to use mechanical measures, and to scold or nag the child, as these measures only tend to make the child persist further. Often a child may be limited too closely in his activities and playthings, since his needs are changing constantly with his growth and development.

Thom[10] feels parents are often so much concerned with a thumbsucking habit that much of real importance to the future mental welfare of the child passes unnoticed. Due to the attitudes of neighbors and relatives on the matter of thumbsucking, parents often have a feeling of failure when they are un-

successful in the prevention of the habit. Parents should take a rational point of view toward the habit although often they are told that the habit has a grave sexual significance. It is one of the most common habits that children develop and is resorted to when the child is out of harmony with the world.

Mrs. Gruenberg,[11] who speaks as a mother as well as a professional woman, feels that consideration should be given to the intensity or persistence of thumbsucking because, even in infancy, excessive thumbsucking may be a symptom. As as public health worker, one should help parents to find the cause, rather than to increase their anxiety. This anxiety and effort on the part of the parent often casues a maladjustment with the child's personality.

Gesell[11] says it is very difficult in infancy and childhood to draw a line between normal and abnormal behavior. In a sense, all children, because none can escape the problem of development, which always presents some difficulties. Absolute concepts, rules of thumb and management devices have very limited uses. Children are changing from day to day. There is ancient wisdom in the mechanism of growth. If parents accept a developmental philosophy about their children they will be able to enjoy them more. Of all natural phenomenon none is more variegated and marvelous that the cycle of child development. Thumbsucking may function as a component of the growth complex. Its harmfulness varies with the type of child and associated behavior.

From the many viewpoints of the various specialists in child growth and development, it would seem that, generally speaking, all agree that sucking is a natural instinct for the child. Some of the opinions are purely personal and others are based on years of study and observation of children. Then there is a difference of opinion about the harmful effects and the methods to control thumbsucking. When it reaches the stage where it becomes a habit, depends upon the specialist's field of observation.

However, as a public health worker, one can bring to parents these conclusions:

1. The sucking instinct is a natural one in the child.

2. Thumbsucking may be an etiological factor in malocclusion.

3. Thumbsucking may be an indication of something wrong in the child's feeding regime.

4. Thumbsucking may be an indication of some emotional disturbance of the child.

5. Discourage the tendency as soon as it manifests itself. Try to discover the cause and, if it is insufficient feeding or lack of attention, supply those needs. The proper time to control thumbsucking is before it has reached the stage where it becomes a habit. At that time is no danger of causing malocclusion of the jaws or the personality.

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